Appendix E

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Hurting Inside and Out? Emotional and Physical Pain in Self-Harm Ideation and Enactment

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Those who self-harm have been shown to be less sensitive to physical pain, but more sensitive to emotional pain, appearing to contradict social neuroscience research that suggests that individuals who are more sensitive to physical pain are also more sensitive to emotional pain. The current study investigated the relationship between self-reported emotional pain sensitivity and physical pain distress in those who think (ideate) about and engage in (enact) self-harm. A total of 351 healthy adults completed a battery of anonymous online questionnaires assessing emotional sensitivity, physical pain distress and sensitivity, and lifetime history of self-harm, as well as depressive symptoms, self-critical style, perfectionistic cognitions, and perfectionistic self-presentation. Emotional sensitivity and physical pain distress were higher in both the self-harm ideation and enactment groups than in controls and there was a significant ordered effect, such that the enactment group was more sensitive to emotional and physical pain than the ideation group. A similar significant ordered effect in physical pain sensitivity was observed only when controlling for previous suicide attempt. Within the ideation group, physical pain distress and self-critical style were the only factors significantly associated with emotional pain sensitivity, but only the presence of perfectionistic cognitions was significantly associated with emotional pain sensitivity in the enactment group. Taken together, the findings suggest an association between self-perceived emotional sensitivity and physical pain distress in self-harm ideation, but possibly a disconnection between self-perceived and behavioral sensitivity to physical pain in self-harm enactment. Furthermore, self-criticism and perfectionism may be differentially associated with emotional sensitivity in self-harm ideation and enactment.

Keywords: emotion reactivity, enactment, ideation, pain, self-injury, suicide

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INTRODUCTION

Self-harm, defined as "self-injury or self-poisoning irrespective of the apparent purpose of the act" (National Institute for Health and Care Excellence, 2004, p. 6),[1] is a context in which physical and emotional pain appear to be inextricably linked. Over the past decade, a significant amount of research from the field of social neuroscience has focused on the relationship between emotional and physical pain perception within normative populations, positing that there is a shared common neural circuitry for physical and emotional pain (Eisenberger, Jarcho, Lieberman, & Naliboff, 2006; Eisenberger, Lieberman, & Williams, 2003). The suggestion that those who are more sensitive to one form of pain are also more sensitive to the other is particularly intriguing when considered within the context of self-harm, where research using behavioral and self-report methods has found individuals who engage in non-suicidal self-injury (NSSI) to be more sensitive to emotional pain (Glenn, Blumenthal, Klonsky, & Hajcak, 2011; Nock, Wedig, Holmberg, & Hooley, 2008) and yet also less sensitive to physical pain (Franklin, Aaron, Arthur, Shorkey, & Prinstein, 2012; Gratz et al., 2011). This pattern of high emotional sensitivity and low physical pain sensitivity is also found in suicidal self-harm (Dour, Cha, & Nock, 2011; Orbach, Mikulincer, King, Cohen, & Stein, 1997). In short, the behavioral and self-report evidence from individuals who have engaged in self-harm would appear to contradict the linear relationship between emotional and physical pain proposed in the social neuroscience literature.

FROM THOUGHTS TO ACTS OF SELF-HARM

Only a proportion of those who have thoughts of self-harm (ideation) will go on to engage in (enact) the behavior. The factors that differentiate someone who ideates from someone who enacts self-harm are something about which we know very little and have been identified as a priority area for future research (Klonsky & May, 2014; O'Connor & Nock, 2014; O'Connor, Rasmussen, & Hawton, 2012). The pathway from thoughts to behaviors is a complex and multifaceted process and has been characterized in the recently proposed Integrated Motivational Volitional (IMV) model of suicidal behavior (O'Connor, 2011). The model is composed of three distinct phases. The pre-motivational phase includes variables, such as social perfectionism, that increase vulnerability to psychological distress. This is followed by the motivational phase, which encompasses variables that are involved in self-harm ideation and in forming the intention to self-harm. Finally, the volitional phase comprises factors that increase the likelihood of an individual making the transition from thinking about self-harm to enacting the behavior. To our knowledge, no study to date has explored either self-reported or behavioral

1. We have employed the term *self-harm* as it is the one most widely used in the U.K. to describe self-injurious behavior. However, we distinguish between self-harm with and without suicidal intent within the Statistical Analysis section of this article and refer to *non-suicidal self-injury* (NSSI) where other authors have employed this term.

sensitivity to physical or emotional pain in individuals who ideate about but have not engaged in self-harm. Hooley, Ho, Slater, and Lockshin (2010) attempted to include an ideation group in their study of pain tolerance and NSSI, but unfortunately they were unable to recruit a sufficient number of individuals reporting ideation without enactment to be statistically viable. We, therefore, do not know if reduced physical pain sensitivity and greater emotional reactivity are uniquely associated with self-harm enactment or if they are also a feature of self-harm ideation. Such a comparison would go some way to answering the key question of whether or not these factors are a cause or a consequence of actual self-harm.

Evidence would strongly suggest that those who have engaged in self-harm have a higher threshold and tolerance for physical pain, an effect that appears to be true for both clinical and nonclinical samples (Magerl, Burkart, Fernandez, Schmidt, & Treede, 2012; St. Germain & Hooley, 2013). It does appear, however, to be subject to temporal variation, with those who currently self-harm having a higher pain threshold than those who do not (Ludäscher et al., 2009), possibly suggesting that pain sensitivity may normalize following self-harm cessation. To date, no investigations have determined if or how emotional pain sensitivity may alter when an individual stops self-harming.

Previous research has found robust and consistent associations between self-harm and certain psychological variables, e.g., social perfectionism, self-criticism, impulsivity, rumination, and the "Big Five" personality traits (see O'Connor & Nock, 2014, for a discussion). Curiously, few to none of these associations have been examined in studies of physical pain and self-harm, thus potential psychological moderators of reduced pain sensitivity in this population remain unknown. Perfectionism, in particular, appears to be a pernicious correlate of self-harm, with the number and frequency of automatic thoughts about needing to be perfect (perfectionistic cognitions) being significantly associated with psychological distress (Flett, Hewitt, Whelan, & Martin, 2007). Perfectionistic self-presentation, the degree to which one needs to appear perfect to others, has also been associated with higher levels of depression and anxiety (Hewitt et al., 2003). A number of recent studies have explored the relationship between self-criticism and physical pain sensitivity in self-harm, demonstrating that self-critical style appears to mediate the relationship between pain analgesia and NSSI in adolescents (Glenn, Michel, Franklin, Hooley, & Nock, 2014), potentially because individuals who are extremely self-critical are more willing to endure pain as a method of self-punishment, feeling that they deserve the pain (Hamza, Willoughby, & Armiento, 2014; Hooley et al., 2010). Furthermore, manipulating feelings of self-worth has been found to decrease sensitivity to pain in those who engage in NSSI (Hooley & St. Germain, 2014). Whether or not a similar relationship exists between self-criticism and physical pain sensitivity in self-harm ideation, or in suicidal self-harm, remains to be seen. Pain-specific cognitions (e.g., feelings of distress) have also received little attention within the extant corpus of research on pain and self-harm, although self-reported ratings of pain unpleasantness either during self-harm or a laboratory self-harm proxy (e.g., the cold pressor test) have been studied (e.g., Russ, Roth, Kakuma, & Harrison, 1994; Russ, Roth, Lerman, & Kakuma, 1992), revealing

lower pain unpleasantness in those who self-harm than in controls. Again, no investigation has been made of pain cognitions in those who ideate about self-harm without engaging in the behavior.

THE PRESENT STUDY

We therefore set out to conduct an exploratory, self-report study of the relationship between emotional and physical pain sensitivity in self-harm and to investigate possible psychological correlates of sensitivity to emotional and physical pain, a previously neglected area of research. Additionally, we also sought to probe the potential temporal aspect of the relationship between self-harm and sensitivity to emotional and physical pain. If the linear relationship between emotional and physical pain, suggested by the social neuroscience literature, is valid for self-harm ideation and enactment, we would expect to find that reporting greater sensitivity to emotional pain would be associated with reporting greater sensitivity to physical pain. However, behavioral evidence from self-harm research would suggest that this may not be the case (e.g., Hooley et al., 2010; Nock & Mendes, 2008; Nock et al., 2008) and instead that we would find those in the self-harm enactment group to report greater sensitivity to emotional pain, but decreased sensitivity to physical pain relative to controls. We hypothesized that we also may see a similar pattern of emotional and physical pain sensitivity in the self-harm ideation group. It was our prediction, therefore, that we would observe an ordered effect for emotional pain sensitivity, such that this would be highest in the self-harm enactment group, followed by the self-harm ideation group, and then controls. Given previous research demonstrating lower levels of pain unpleasantness reported by those who have self-harmed, we also predicted that we would see a reverse of this ordered effect for physical pain distress and pain sensitivity: controls > self-harm ideation > self-harm enactment. We also hypothesized that self-reported physical pain sensitivity would be lower in those who had self-harmed more recently than in those who had self-harmed longer ago.

METHODS

PARTICIPANTS AND PROCEDURE

A total of 351 healthy adults from a Scottish university took part in the study. The mean age of the participants was 19.8 (*SD*: 4.2) years, and 70% of the sample was female. No data on the ethnicity of the sample were collected. The study was anonymous and conducted through the Internet, therefore we cannot be sure of participants' ethnicity; however, the majority of students within the university are White. A small percentage of the sample (13.4%) reported that they had a current or lifetime diagnosis of a mental health issue, 86% reported no current or lifetime diagnosis, and 0.6% did not answer this question.

The study received ethical approval from the University of Stirling Psychology Department Ethics Committee. Participants signed up for the study through the university's online experiment management system, and all received course credit for their participation. Upon signing up, all participants were directed to a secure third-party website where they first gave written informed consent; following this they were presented with a battery of online questionnaires to be answered anonymously.

MEASURES

Self-Harm Thoughts and Behaviors. Four questions modified from the U.K. Adult Psychiatric Morbidity Survey (McManus, Meltzer, Brugha, Bebbington, & Jenkins, 2009) were used to assess non-suicidal self-harm thoughts and behaviors (two questions) and suicidal self-harm thoughts and behaviors (two questions). Persons responding "yes" to either of the questions regarding thoughts of self-harm and "no" to both of the questions regarding behavioral engagement were placed in the ideation group. Persons responding "yes" to either of the questions pertaining to behavioral engagement were placed in the enactment group. A similar method has been employed previously to assess self-harm ideation and enactment with good effect (O'Connor et al., 2012).

Emotional Pain Sensitivity. The 21-item Emotion Reactivity Scale (ERS; Nock et al., 2008) was used as a measure of sensitivity to emotional pain and has previously been employed in studies of self-harm (Glenn et al., 2011). There is a sensitivity subscale of the ERS, but due to the high intercorrelation between the three subscales, a single-factor (total score) solution is usually favored (Claes, Smits & Bijttebier, 2014; Nock et al., 2008). Internal consistency was very good, $\alpha = .95$.

Physical Pain Distress and Sensitivity. Physical pain distress was assessed by administration of the 26-item Pain Distress Inventory (PDI; Osman et al, 2003), with the pain sensitivity subscale being used to assess self-perceived sensitivity to physical pain. While never before used in a study of self-harm, it has been used in community samples (Osman et al., 2005). Overall internal consistency for this sample was very good, $\alpha = .95$, as was the case for the sensitivity subscale: $\alpha = 94$.

Depressive Symptoms. The 21-item Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) was used to assess depressive symptoms. This measure has been widely used in community and clinical settings (McAuliffe et al., 2014; McCoy, Fremouw, & McNeil, 2010) to evaluate depressive symptomatology in those who have engaged in self-harm. Due to a technical issue, 285 of the participants completed only 19 items of the BDI,[2] whereas 66 completed the full 21 items. The 19-item version was used for all analyses and still demonstrated very good internal consistency: Cronbach's alpha = .92.

Perfectionistic Cognitions. The presence and level of perfectionistic cognitions were measured with the Perfectionistic Cognitions Inventory (PCI; Flett, Hewitt,

2. Items 3 (past failure) and 6 (punishment feelings) were the two missing items from the BDI-II.

Blankstein, & Gray, 1998). This scale assesses the frequency of automatic thoughts about needing to achieve extremely high standards and has been conceptualized as a state rather than trait characteristic. While the PCI score is highly correlated with socially prescribed perfectionism, it has been found to predict variance in negative psychological outcomes in excess of that explained by social perfectionism (Flett et al., 2012). Internal consistency of the PCI was high in this sample, $\alpha = .95$

Perfectionistic Self-Presentation. The extent to which dispositional perfectionism is expressed interpersonally, such as by concealing one's imperfections or by actively demonstrating ways in which one is "perfect," was measured using the Perfectionistic Self-Presentation Scale (PSPS; Hewitt et al., 2003). Internal consistency for the scale as a whole was very good, $\alpha = .94$, and the three subscales demonstrated good consistency: perfectionistic self-promotion: (.91); nondisplay of imperfection: (.90); and nondisclosure of imperfection: (.82).

Self-Critical Style. The eight-item Self Rating Scale (SRS; Hooley et al., 2010) assesses the extent to which individuals endorse feelings of worthlessness, guilt, social ineptitude, shame, and inferiority. Internal consistency was very good, $\alpha = .90$.

STATISTICAL ANALYSES

We employed a series of Jonckheere-Terpstra nonparametric trend tests to investigate the predicted ordered effects within the emotional and physical pain sensitivity and physical pain distress results (O'Carroll, Drysdale, Cahill, Shajahan, & Ebmeier, 1999). To examine the effect of recency of self-harm upon emotional and physical pain sensitivity, cases were selected if they had reported ever engaging in self-harm, then a dummy variable was created for recency and used in the linear regression. Univariate linear regressions were conducted for each potential correlate of emotional or physical pain sensitivity, and those that were significant were then entered into multivariate linear regressions. In order to probe whether or not there were differential findings depending on whether participants endorsed having engaged in self-harm with suicidal intent, compared to participants who reported never having suicidal intent during self-harm, analyses were also run excluding participants who reported a lifetime suicide attempt. In all but two cases (physical pain sensitivity and correlates of physical pain sensitivity), there were no changes in the significance or direction of the results. Therefore, all other results reported here are irrespective of suicidal intent, save for the Jonckheere-Terpstra analysis of physical pain sensitivity and the linear regression analyses of variables associated with pain sensitivity. Data were analyzed using SPSS v21 for Windows.

RESULTS

Of the 351 individuals in the sample, 28% reported self-harm ideation ($n = 98$), with a further 28% reporting self-harm enactment ($n = 97$), and 44% endorsing

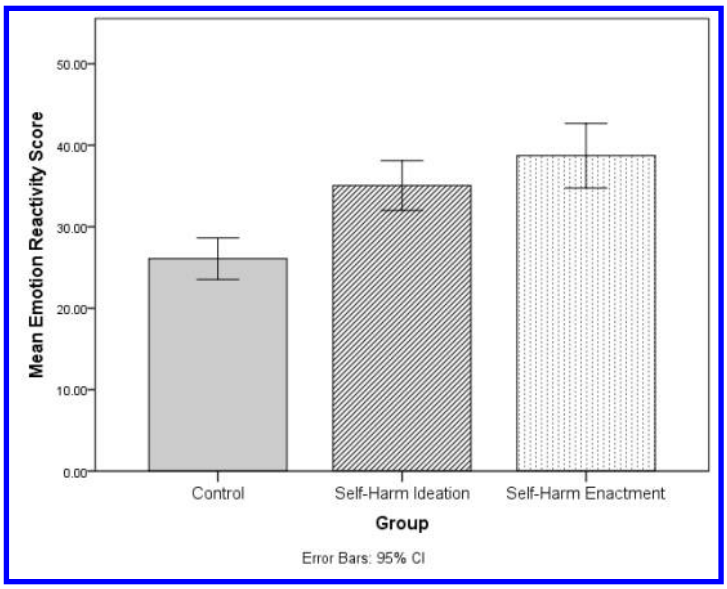

FIGURE 1. Emotion reactivity is higher in both the self-harm ideation and self-harm enactment groups relative to controls and demonstrates a significant ordered effect: self-harm enactment > self-harm ideation > controls.

no lifetime history of ideation or enactment (n = 156). There were no significant differences between the groups in age, $F(2, 338) = 1.79$, *ns*, or gender, $\chi^2(2) = 1.76$, *ns*. Within the self-harm enactment group, 27% reported having made a previous suicide attempt with or without NSSI (n = 26) and 73% reported engaging only in NSSI (n = 71). Only 7 individuals reported having made a previous suicide attempt in the absence of NSSI behavior. The majority of individuals within the self-harm ideation group reported experiencing only suicidal thoughts (n = 54), whereas only 15 individuals reported exclusively NSSI thoughts and 29 reported thoughts of both suicidal and non-suicidal self-harm.

EMOTIONAL PAIN SENSITIVITY

In order to assess whether sensitivity to emotional pain exhibited an ordered effect, such that emotional pain sensitivity was greatest in the self-harm enactment group, followed by self-harm ideation, and then controls, with the lowest sensitivity to emotional pain, a Jonckheere-Terpstra trend test was performed. Results showed a significant ordered effect: self-harm enactment > self-harm ideation > controls, Jonckheere-Terpstra $Z = 5.98$, $p < .001$. See Figure 1. Mean scores were 38.73 (*SD* 19.68), 35.06 (*SD* 15.26), and 26.07 (*SD* 16.06) for enactment, ideation, and control groups, respectively.

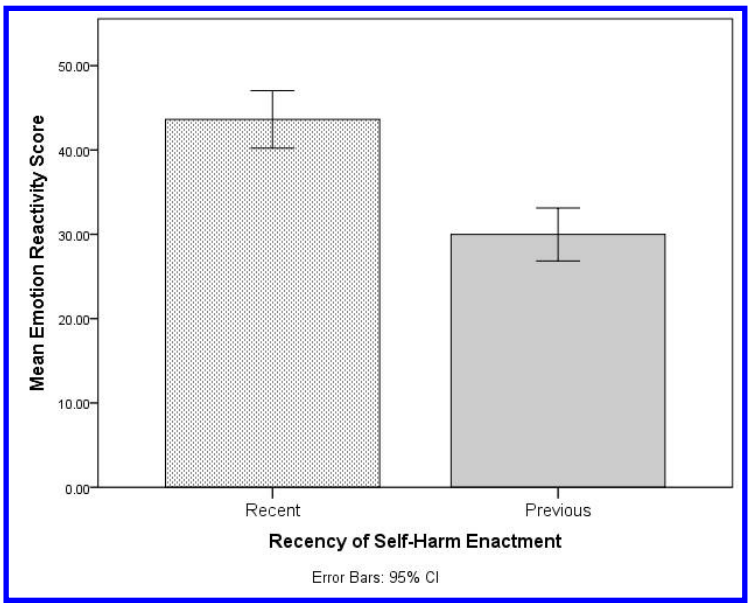

FIGURE 2. Higher emotion reactivity was significantly associated with more recent self-harm enactment.

PHYSICAL PAIN DISTRESS AND SENSITIVITY

Similar to the analysis for the effect of group upon emotional pain sensitivity, a Jonckheere-Terpstra trend test was employed. This demonstrated a significant ordered effect: the enactment group demonstrated the greatest self-reported physical pain distress, followed by the ideation group, and then controls, with the least physical pain distress, Jonckheere-Terpstra $Z = 4.10$, $p < .001$. Mean scores were 42.38 (*SD* 18.91), 39.88 (*SD* 20.99), and 31.95 (21.04) for enactment, ideation, and control groups, respectively. Examination of the pain sensitivity subscale revealed that there was no significant ordered effect in pain sensitivity across the three groups, Jonckheere-Terpstra $Z = 1.68$, *ns*. However, when those reporting a previous suicide attempt were removed from the analysis, a significant ordered effect emerged for physical pain sensitivity, with those in the self-harm enactment reporting greatest pain sensitivity, followed by the ideation group, and then controls, Jonckheere-Terpstra $Z = 2.09$, $p = .037$. Mean scores were 7.58 (*SD* 7.08), 7.41 (*SD* 6.45), and 5.75 (*SD* 5.85) for the enactment, ideation, and control groups, respectively.

RECENCY OF SELF-HARM

Within the self-harm enactment group, a dummy variable was used to dichotomize recency of self-harm into recent (within the past year) or more distant (>

TABLE 1. Odds ratios, *p* values, and 95% confidence intervals for multivariate linear regressions with emotional pain sensitivity score as the outcome variable

	OR	*p*	95% CI	
Ideation				
Perfectionistic cognitions	–.008	.157	–2.196	17.786
Self-rating	.339	.004*	–.140	.127
Physical pain distress	.399	< .001*	.162	.418
Perfectionistic self-presentation	.004	.974	–.111	.115
Depressive symptoms	.078	.455	–.215	.475
Enactment				
Perfectionistic cognitions	.249	.004*†	.083	.424
Self-rating	.158	.229	–.154	.637
Physical pain distress	.065	.453	–.111	.248
Perfectionistic self-presentation	.125	.163	–.035	.204
Depressive symptoms	.311	.016*	.104	.997

*Significant at .05. †Remained significant when those reporting a previous suicide attempt were removed from analyses.

1 year ago) and then entered into a linear regression. Recent self-harm was significantly associated with higher levels of emotional pain sensitivity than previous self-harm, $\beta = .299$, $t(94) = 2.98$, $p = .004$, 95% CI [3.99, 19.88]; see Figure 2. Such an association did not, however, exist between recency of self-harm and physical pain distress, $\beta = .200$, $t(94) = 1.84$, *ns*, 95% CI [–.629, –15.9] or pain sensitivity, $\beta = –.099$, $t(94) = –.915$, *ns*, 95% CI [–4.32, 1.60].

CORRELATES OF EMOTIONAL PAIN SENSITIVITY

Potential correlates of emotional pain sensitivity were investigated separately in the self-harm ideation and enactment groups. All variables, apart from gender and age, were significantly associated with emotional pain sensitivity in the ideation group, all *p*s < .05, and the enactment group, all *p*s < .01, such that higher emotion reactivity score correlated with higher physical pain distress and sensitivity, greater depressive symptoms, more perfectionistic self-presentation, greater presence of perfectionistic cognitions, and higher levels of self-criticism/feelings of worthlessness (self-rating score). All variables that emerged as significant in the univariate analyses were then entered into a multivariate linear regression (see Table 1). Within the ideation group, being more self-critical and having higher physical pain distress were the only variables significantly associated with higher emotion reactivity. Greater depressive symptoms and presence of perfectionistic cognitions were the only variables associated with emotion reactivity in the enactment group.

CORRELATES OF PHYSICAL PAIN DISTRESS AND SENSITIVITY

For the ideation group, all variables except age and gender emerged from the univariate linear regressions as significantly associated with physical pain distress, all *p*s < .01. When these variables were entered into a multivariate model, however, only emotion reactivity remained significant, $\beta = .451$, $t(92) = 4.493$, $p < .001$, 95% CI [.346, .895]. No variables were significantly associated with physical pain sensitivity in either univariate or multivariate analyses. Within the enactment group, age was the only variable not associated with physical pain distress in the univariate analyses, all other *p*s < .05. None remained significant once entered into a multivariate model. For pain sensitivity, perfectionistic cognitions and self-criticism emerged as significant in the univariate analyses, both *p*s < .05; however, only presence of perfectionistic cognitions remained significant in multivariate analyses. When those participants reporting a previous suicide attempt were excluded, perfectionistic cognitions became nonsignificant, but self-criticism emerged as significantly associated with physical pain sensitivity.

DISCUSSION

The current study is, to the best of our knowledge, the first investigation of the relationship between emotional and physical pain sensitivity in self-harm ideation and enactment. Our findings show that emotion reactivity is increased in those who have engaged in self-harm, relative to controls, consistent with previous research (Glenn et al., 2011; Nock et al., 2008). They also extend our knowledge by demonstrating that emotion reactivity is also elevated in those who have thought about but never engaged in self-harm. The predicted ordered effect for emotional pain sensitivity was significant and may suggest that increasing sensitivity to emotional pain may accompany a transition from thinking about self-harm to acting on those thoughts. However, the difference in mean scores between the ideation and enactment groups was small; therefore, other factors may be important in differentiating those who ideate from those who enact. There were no significant differences in the pattern of emotion reactivity across the three groups when controlling for previous suicide attempts, suggesting that these findings may extend to suicidal self-harm as well as NSSI.

A less clear picture emerges when trying to interpret the physical pain results. Once again, we found a significant ordered effect (self-harm enactment > self-harm ideation > controls), however, this was in the direction opposite to our prediction. The overall pain distress score was highest in the enactment group, then the ideation group, and then controls. Upon closer examination of the subscale results, we found that pain sensitivity did not differ significantly among the three groups, however, when those reporting a previous suicide attempt were removed

from the analyses, a significant ordered effect emerged, but again, in the direction opposite to our prediction (self-harm enactment > self-harm ideation > controls). This is a particularly interesting result because it contradicts the majority of previous behavioral research on physical pain sensitivity in self-harm, which has generally found that those who have engaged in NSSI or have made previous suicide attempts have a much *lower* sensitivity to physical pain than controls (Hooley & St. Germain, 2014; Orbach et al., 1997). This suggests that there is a difference between self-perceived pain sensitivity and behavioral sensitivity in those who have engaged in self-harm. A number of previous studies have suggested that the majority of individuals report that they do not experience pain during self-harm (e.g., Kemperman et al., 1997; Russ et al., 1992). As the pain sensitivity scale did not assess participants' physical pain sensitivity during self-harm or during a behavioral self-harm proxy, this measure may in fact speak more to individuals' *anticipation* of pain rather than their sensitivity. Additionally, the majority of questions that comprise the pain sensitivity subscale relate to fear of pain, e.g., "I am terrified of being in pain." We also urge caution when interpreting the ordered effect in the pain sensitivity results, as the means for the enactment and ideation groups were very close and standard deviations were high.

Given that the difference between groups for pain sensitivity emerged only when controlling for prior suicide attempts within the enactment group, it is therefore perhaps surprising in the initial analysis (including both NSSI and suicidal self-harm) that scores on this scale were not lower for the enactment group than for the ideation or control groups, since decreasing fear of and aversion towards pain are said to be key components of acquired capability for suicide (Joiner, 2005; Van Orden et al., 2010). This heightened self-reported fear of pain could potentially suggest that those who self-harm with suicidal intent are not necessarily aware of their increased capability. As these differences were small, it would seem then that differences in other types of pain cognitions were driving the significant overall difference in pain distress between the control and self-harm groups. These results may be indicative that the difference in individuals' perception of their pain distress relative to their behavioral sensitivity results from the altered cognitions that are present during psychological distress (Anestis et al., 2012). Those who think about and engage in self-harm may underestimate their own internal resources for coping with physical pain, thus leading to higher self-reported physical pain distress relative to behavioral sensitivity. The elevated levels of self-reported physical pain distress observed in the self-harm ideation group may support this, suggesting that cognitions regarding the ability to withstand physical pain begin to become distorted around the onset of self-harm ideation, before an individual has ever engaged in self-harm.

A previous study by Lightsey and colleagues (2008) found that the relationship between pain distress and negative affect in female college students was mediated by emotion-oriented coping, whereby an individual concentrates on the negative feelings associated with a situation, such that greater use of emotion-oriented coping was related to higher levels of pain distress. Emotion-oriented coping is generally regarded in the extant literature as being deleterious and indicative of

poor emotion regulation (Karekla & Panayiotou, 2011). While we did not measure emotion-oriented coping or regulation, our finding that emotion reactivity was significantly higher in both self-harm ideation and enactment groups than in controls could suggest that higher pain distress is the result of a generally more emotion-oriented, reactive response to distress, whether physical or emotional. It would also be consistent with recent research that reported decreased emotion regulation in NSSI, independent of emotion reactivity (Davis et al., 2014).

Emotional pain sensitivity appears to be subject to temporal variations, with those who had engaged in self-harm within the past year exhibiting higher emotion reactivity than those whose last episode of self-harm was longer ago, a pattern similar to that identified by Ludäscher and colleagues (2009) for physical pain sensitivity and self-harm cessation. Our findings also show that sensitivity to emotional pain is heightened in self-harm ideation as well as enactment, although is not significantly different between the two groups. Interpreting this within the context of the IMV (O'Connor, 2011), this potentially means that emotional pain sensitivity is a pre-motivational or motivational phase variable, conferring elevated risk for developing thoughts of self-harm, but not for translating those thoughts into actions. Additional support for this idea is that higher emotional pain sensitivity was also associated with being more self-critical and having greater presence of perfectionistic cognitions; self-criticism and perfectionism are both characterized as pre-motivational phase variables within the model.

The results that emerged from our analyses, however, did suggest that there were different correlates of emotional pain sensitivity for those who reported only self-harm ideation than for those who had engaged in self-harm. Within the ideation group, higher emotional pain sensitivity was associated with higher physical pain distress and being more self-critical, but for the enactment group, only greater presence of perfectionistic cognitions and higher depressive symptoms were significantly associated with being more sensitive to emotional pain. Self-criticism has been characterized as a facet of evaluative concerns perfectionism (O'Connor, 2007); therefore these findings may suggest that particular elements of perfectionism, when combined with high emotional pain sensitivity, are differentially associated with either ideation or enactment.

There were also differences in the correlates of physical pain sensitivity within the enactment group when controlling for previous suicide attempts. Being more self-critical was associated with physical pain sensitivity only when those with prior suicide attempts were excluded, whereas within the mixed intent (but predominantly NSSI) sample, only perfectionistic cognitions were associated with pain sensitivity. Potentially this suggests a differential association between dimensions of perfectionism and pain sensitivity, depending upon suicidal intent. This knowledge could be particularly useful when attempting to develop interventions aimed at managing perfectionism, as attention may be able to be focused upon regulating particular components of perfectionism that are more closely associated with self-harm enactment as opposed to ideation and also with suicidal self-harm relative to NSSI. Our findings also further highlight the need to take into account individually specific risk factors when deciding upon a treatment plan. Future re-

search should attempt to further probe the relationship between perfectionism and self-harm ideation and enactment.

The current study must be interpreted within the context of its limitations. The design was cross-sectional, therefore no inferences can be made about how emotional and physical pain sensitivity relate to future self-harm thoughts or behaviors. Also, as the data were all self-reported, they may be subject to recall bias or demand characteristics, however, as the questionnaires were all anonymous, this could perhaps have reduced participants' wish to report more socially desirable answers. In fact, online self-report measures have often been found to elicit more truthful answers, particularly when the research topic is sensitive (Tourangeau & Yan, 2007). While we have discussed the potential relationship between self-report and behavioral measures, these are inferences based upon comparison of our self-report data to extant behavioral research. To make more meaningful comparison of these two types of measures, it would be necessary to directly compare both self-report and behavioral measures of emotional and physical pain sensitivity within a single study, and future research should investigate this. The self-harm enactment group in the present study was comprised of those who had engaged in NSSI, with or without a previous suicide attempt. Even though we controlled for this in the analyses and found (with two exceptions) no significant difference in the findings irrespective of whether those with a suicide attempt were included, such statistical controls are not necessarily an adequate substitute for design controls, i.e., directly comparing those who have attempted suicide to those who have not. Unfortunately the current study lacked the necessary statistical power to perform subgroup analyses, directly comparing those who have thought about or engaged in suicidal behavior with those whose thoughts and behaviors are non-suicidal in intent. While some of those who engage in NSSI will never make a suicide attempt, there is evidence to suggest that a disproportionate number of those who have done so will have also made a suicide attempt at some point (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). Therefore, even with a sample weighted heavily towards NSSI, this study improves our understanding of the factors that may precede suicidal thoughts or behaviors. Given the likely heterogeneity within the groups, it would be helpful to employ larger samples of those reporting ideation and enactment to ensure sufficient statistical power for analyses comparing variables as a function of suicidal intent.

Despite these limitations, we feel that this study makes a novel contribution to the literature on the relationship between emotional and physical pain sensitivity and for the first time presents analyses of this relationship and its correlates in self-harm ideation and enactment.

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